Remarks

Claims 1 and 19 are amended and claims 20 to 27 are added. Claims 1 to 27 are pending in this application of which claims 1, 20 and 24 are in independent form.

Claims 1, 2, 6 and 11 to 18 were rejected under 35 USC 102(b) as being anticipated by Rose et al. The following will show that claim 1 patentably distinguishes the invention over this reference.

It is true that Rose et al discloses an imaging system having a corrector incorporating certain features of applicants' claim 1. However, the mirror corrector unit set forth in applicants' claim 1 distinguishes very substantially from the corrector shown in Rose et al. In the applicants' mirror corrector unit set forth in claim 1, the entry and exit edges of the magnetic deflecting region are so selected that the quadrupole components ensure that a <u>maximum</u> of two planes occur over the entire path of the electron beam between a first-time exit from the magnetic beam deflector up to the objective lens with these two planes being conjugated with the diffraction plane of the objective lens. This feature and limitation is set forth in claim 1 with the clause:

> "... said magnetic beam deflector including a plurality of quadrupoles which are so determined that on the entire course of said beam path between a first-time exit from said magnetic beam deflector and said objective lens, a <u>maximum</u> of two planes occur conjugated to said diffraction plane of said objective lens." (emphasis added)

In order to appreciate the above feature and limitation of the applicants' invention, the applicants note that with respect to FIG. 1, an electron, which comes from the source 1, enters the deflector at the magnetic sector 21 for the first time. The electron runs through the magnetic sectors (21, 22, 23) and exits the deflector for the first time from the magnetic sector 23. At this location, the path begins which is essential for the applicants' invention. The electron, which first runs along the optical axis OA2 after the first exit from the magnetic sector 23, runs first to the mirror 29 and is there reflected and reenters the deflector 23 and runs through the magnetic sectors 23, 24, 25 and thereafter propagates along the optical axis OA3 in the direction toward the objective 16. According to the last feature of applicants' claim 1, only two planes conjugated to the diffraction plane 28 occur on the entire path between the first-time exit from the magnetic sector 23, namely, on the path to the mirror 29, from mirror 29 back to the magnetic sector 23 and through the magnetic sectors 23, 24, 25 up to the diffraction plane 28 of the objective 16.

In contrast to the applicants' invention, in the same path segment in the corrector of Rose et al, there are four planes conjugated to the diffraction plane of the objective lens 10 shown in FIG. 1 of the drawings of Rose et al.

The diffraction plane of this objective 10 is that plane in which the diagonal plane 3h of the deflecting element 3 is imaged, that is, that plane, which lies just ahead of the objective 10, in which rays cross which exit from the objective parallel to the optical axis thereof. A first plane, which is

conjugated to the diffraction plane of the objective lens, is therefore in the diagonal plane 3h of the deflector 3 and a second plane, which is conjugated to the diffraction plane, lies in the diffraction plane 7 in which the hexapole 18 is arranged and a third plane, which is conjugated to the diffraction plane of the objective lens, lies in the plane of the mirror 5 and, because of the reflection at this mirror 5, a further image of the diffraction plane of the objective lens occurs in the plane 7 wherein the hexapole 18 is arranged. In this way, a total of three different planes would result but, because of the reflection at the mirror 5, four planes in total occur which are conjugated to the diffraction plane of the objective lens.

The number of required planes, which are conjugated to the diffraction plane of the objective lens, is an index as to how well the deflector 8 is telescopically designed. For a deflector or corrector according to the applicants' invention, the deflector is substantially telescopic with the consequence that component beams, which go out from the intersect points (30, 31) of the symmetry planes with the optical axis, run parallel to the optical axis after exiting from the deflector or run slightly convergent thereto. This is shown in applicants' FIG. 3 wherein the courses of the fundamental paths are shown. Because this deflector is substantially telescopic, only two planes, which are conjugated to the diffraction plane of the objective lens, are needed.

In contrast to the applicants' invention, the deflector of Rose et al is not telescopic, that is, electrons, which proceed from the intersect point of the symmetry planes (3h, 3g) of the

deflector with the optical axis, run divergent outside of the deflector. Because of this divergence, another beam guidance is required which perforce leads to a greater number of planes conjugated to the diffraction plane of the objective lens.

In view of the foregoing, applicants submit that claim 1 patentably distinguishes the invention over Rose et al and should now be allowable.

The applicants respectfully disagree with the Examiner's view with respect to claim 11 expressed on page 3, paragraph 13, of the action. It is true that in accordance with Rose et al at column 4, lines 28 to 30, the rearward image plane of the condenser lens is stigmatically imaged in an intermediate plane 7 which lies between the mirror and the deflector 3. Moreover, in the same passage, it is also disclosed that the rearward diffraction plane of the condenser lens is imaged in the diagonal plane 3g of the deflector. The feature of claim 11 is, however, not limited to require only a stigmatic imaging; rather, in claim 11, the plane is also defined wherein imaging takes place, namely, the symmetry planes and it is further recited which particles are imaged there, namely, those particles are imaged in these symmetry planes which run along the paths which are parallel or virtually parallel to the optical axis. Accordingly, claim 11 therefore defines precisely the concept of the applicants' invention, namely, to substantially telescopically configure the deflector so that rays, which enter parallel to the optical axis, are focused in the symmetry plane.

In contrast thereto, the deflector of FIG. 1 of Rose et al focuses such rays into the symmetry plane 3h which already enter

the deflector convergent. This emphasizes the difference in the design of the deflectors, namely, the deflector of the invention is configured as a telescopically imaging system.

With respect to the comment on page 4, paragraphs 21 and 22, with respect to claim 3, applicants note that in FIG. 6 of Rose et al, only a single outer pole shoe pair and three inner pole shoe pairs are provided (each pole shoe pair forms a magnetic sector). Furthermore, the three inner pole shoe pairs are, however, provided for different directional deflections. For each individual 90° deflection, only a single inner pole shoe is provided in each case; that is, between an entry into the deflector and the subsequent exit, only an outer magnetic field and an inner magnetic field are run through.

In contrast to Rose et al, claim 3 specifies that three magnetic sectors are run through between an entry and the next-following exit and, overall, at least five magnetic sectors are provided. In this way, in that for each directional deflection, three magnetic sectors are provided, concave windings (windings along concave paths) are avoidable.

As to the rejection of claims 17 and 18, applicants respectfully submit that the combination of Rose et al and Weimer et al is inappropriate. Here, applicants note that according to claims 17 and 18, it is not the condenser lenses which are intended to be configured as immersion lenses as they are in the teaching of the passage cited in the action with respect to Weimer et al; rather, the field lenses should be configured as immersion lenses. There is no discussion in Weimer et al as to field lenses, that is, lenses whose primary

plane lies in or near an image field. The advantage of configuring the field lenses as immersion lenses is that, for different electron energies, which are required for different applications, the especially critical corrector can always be driven at the same potential.

Applicants also respectfully disagree with the rejection of claim 19 because claim 19 does not only contain the feature that a detector is provided; rather, claim 19 specifies additionally that the objective-near magnetic sector of the deflector functions to separate the electrons, which are backscattered or emitted by the specimen, from the incident primary electron beam.

In view of the foregoing, applicants respectfully submit that claims 1 to 19 patentably distinguish the invention over the references applied thereagainst and should now be allowable.

Reconsideration of the application is earnestly solicited.

Respectfully submitted,

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